

mer, Mifflington, Bethlehem, Carlisle, Chambersburg, Reading, Huntington, Norristown, Easton, Columbia, Pine Grove, Harrisburg, West Chester, Pittsburgh, and Erie, Pa., where trees were blown down, houses unroofed, telegraphic communication interrupted, and railroad traffic delayed. While the center of this storm passed nearly as far west as Pittsburg the damage along the New Jersey coast was much greater than might have been expected. Several branch lines of the West Jersey Railroad were washed out, telegraph wires were blown down, and many small vessels were washed ashore.

The storm in New York state began about midnight of the 13th and did little damage except in the western portion and on the Lakes. On Lake Erie, off Dunkirk, the "Dean Richmond" foundered with 18 persons. Smaller vessels were reported as being wrecked all along the coast. The total known loss on the Lakes is 13 vessels, 54 lives, and \$676,000; this is the greatest loss ever known in proportion to the number of vessels out. At Manistique, Mich., a raft of logs valued at \$50,000 was lost. At New London, Conn., the wind reached a maximum velocity of 63 miles at 2.23 a. m., the 14th, all boats from New York delayed, and Light Ship "Martha Emma" wrecked. At New Haven, Conn., the wind reached 50 miles. Telephone lines over Vermont, near Montpelier, were damaged.

In Massachusetts the storm visited North Billerica, Hadley, Mansfield, and Boston, but no greater damage done than uprooting trees. The gales attending this storm were felt as far east as Portland, Me., and west as far as Duluth, Minn., during the 15th, as the storm center passed off in the direction of Labrador.

17th.—Hail fell at Fort Buford, N. Dak., at intervals,

from noon until 2.30 p. m. Twenty miles to the southwest, in Montana, a small number of cattle were killed by lightning.

20th.—During a severe thunderstorm near Uniontown, Pa., a large mill was struck by lightning; estimated loss about \$5,000. Four sheep were killed by lightning at Tiffin, Ohio.

24th.—A heavy gale prevailed on Lakes Superior, Huron, and Erie, and stopped navigation at the Straits of Mackinac. A schooner was wrecked 7 miles from Grand Island in Lake Superior. The crew were rescued, but the vessel, valued at \$25,000, was a total loss. A number of other accidents occurred. A report from Los Angeles, Cal., states that the heavy rains of the past two days, in the San Bernardino and Santa Ana valleys have damaged raisins and grains.

28th.—Severe gales prevailed over the Lake region. On Lake Superior the gale was accompanied by a heavy fall of snow, and snow squalls marked its progress across lower Lake Michigan, upper Lake Huron, and Georgian Bay. A number of wrecks were reported.

29th.—At Palermo, N. Y., a severe storm blew down buildings.

INLAND NAVIGATION.

STAGE OF WATER IN RIVERS.

The following table shows the danger-points at the various river stations; the highest and lowest stages for the month, with the dates of occurrence; and the monthly ranges:

Heights of rivers above low-water mark, October, 1893.

Stations.	Danger-point on gauge.	Highest water.		Lowest water.		Monthly range.
		Height.	Date.	Height.	Date.	
<i>Red River.</i>	<i>Feet.</i>	<i>Feet.</i>		<i>Feet.</i>		<i>Feet.</i>
Shreveport, La.	29.2	5.4	10	—2.6	1, 2	8.0
<i>Arkansas River.</i>						
Fort Smith, Ark.	22.0	12.0	4	—1.0	25, 28-31	13.0
Little Rock, Ark.	23.0	13.0	6	3.5	29, 31	9.5
<i>Missouri River.</i>						
Fort Buford, N. Dak.	25.0	7.3	17	6.3	1, 2	1.0
Bismarck, N. Dak.	75.0	2.7	23, 30	2.1	1-4, 17, 18	0.6
Pierre, S. Dak.	13.0	—3.8	3, 7, 11-14	—4.0	5, 6, 20-27	0.2
Sioux City, Iowa.	18.7	6.1	22-31	5.5	1, 4-8	0.6
Omaha, Nebr.	18.0					
Kansas City, Mo.	21.0	7.3	5	5.4	17-19	1.9
<i>Mississippi River.</i>						
Saint Paul, Minn.	14.0	3.1	7, 8	2.7	4	0.4
La Crosse, Wis.	10.0	3.1	16	2.1	1-3	1.0
Dubuque, Iowa.	16.0	3.1	27	2.0	1, 2	1.1
Davenport, Iowa.	15.0	2.0	29	1.2	1-4	0.8
Keokuk, Iowa.	14.0	1.4	11, 19, 24-26	0.7	1	0.7
Hannibal, Mo.	17.0	1.9	23-26, 31	1.3	1, 2	0.6
Saint Louis, Mo.	30.0	4.2	7, 11-13	3.3	31	0.9
Cairo, Ill.	40.0	10.3	26	5.0	6-8, 22	5.3
Memphis, Tenn.	33.0	5.8	28	2.7	9, 10, 24	3.1
Vicksburg, Miss.	41.0	4.0	11	0.3	29	3.7
New Orleans, La.	13.0	4.9	2	2.8	26	2.1
<i>Ohio River.</i>						
Parkersburg, W. Va.	38.0	9.0	15	1.2	1, 2, 13	7.8
Cincinnati, Ohio.	45.0	19.5	18	5.0	3	14.5
Louisville, Ky.	24.0	8.0	20	3.0	1	5.0
<i>Cumberland River.</i>						
Nashville, Tenn.	40.0	3.2	14	0.8	31	2.4
<i>Tennessee River.</i>						
Chattanooga, Tenn.	33.0	9.6	17	1.7	16	7.9
Knoxville, Tenn.	29.0					
<i>Monongahela River.</i>						
Pittsburg, Pa.	22.0	6.8	16	5.3	20	1.5
<i>Savannah River.</i>						
Augusta, Ga.	32.6	18.8	14	6.0	31	12.8

Heights of rivers—Continued.

Stations.	Danger-point on gauge.	Highest water.		Lowest water.		Monthly range.
		Height.	Date.	Height.	Date.	
<i>Willamette River.</i>	<i>Feet.</i>	<i>Feet.</i>		<i>Feet.</i>		<i>Feet.</i>
Portland, Oregon.	15.0	9.8	9, 10, 12	2.0	3	7.8
<i>Susquehanna River.</i>						
Harrisburg, Pa.	17.0	5.3	16	1.2	13	4.1
<i>Alabama River.</i>						
Montgomery, Ala.	48.0	3.9	5	0.1	31	3.8
<i>James River.</i>						
Lynchburg, Va.	18.0	7.3	15	0.8	1, 2	6.5
<i>Sacramento River.</i>						
Red Bluff, Cal.	22.0					
Sacramento, Cal.	25.0	8.5	13	7.7	6-9, 30, 31	0.8
<i>Des Moines River.</i>						
Des Moines, Iowa.	19.0	3.2	27-31	2.7	9-24	0.5

FLOODS.

The column giving the highest stages of water during October shows that none of the rivers there mentioned rose to the danger point during this month; the following reports as to other rivers have been received:

New Mexico.—The Hondo River rose on the 5th and 6th 8 feet higher than was ever known before, and considerable damage was done.

South Carolina.—The Wateree River rose from the 22d-24th, reaching 31 feet at Camden bridge, being the highest rise since 1886.

Virginia.—On the 15th and again on the 23d the James River overflowed its banks at Irwin.

CLOSING OF NAVIGATION.

Lakes and rivers continued open to navigation during October, excepting local interruptions, due to low water in the upper Missouri and Mississippi rivers.

ATMOSPHERIC ELECTRICITY.

THUNDERSTORMS AND AURORAS.

The following table shows in detail for October, 1893, (1) the number of stations from which meteorological reports

were received; (2) the number of such stations reporting thunderstorms (T) and auroras (A), respectively, in each state and on each day of the month on which the phenomena were observed:

Thunderstorms and auroras, October, 1898.

States.	No. of stations.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.	Total.				
Alabama	53	T.	2	1			1																										4	T.			
Arizona	44	T.												2	1								1										4	T.			
Arkansas	41	T.	3			7						2														4	6						22	T.			
California	291	T.								3																							3	T.			
Colorado	77	T.	1		1															3		1				1							7	T.			
Connecticut	24	T.																											1				1	T.			
Delaware	5	T.																											1				2	T.			
District of Columbia	4	T.													1																		1	T.			
Florida	35	T.	3	7	3	2						1	1						1	1	1	1		2				1			2		26	T.			
Georgia	66	T.			1																													1	T.		
Idaho	12	T.																																0	T.		
Illinois	52	T.	2	12		5	3					3	2		1						3						4	3					37	T.			
Indiana	40	T.		4	2	1																						4	5					17	T.		
Indian Territory	4	T.	1				1																				1							2	T.		
Iowa	76	T.	13	8		1	14	7				9	4	1							1				1		4	1	2				66	T.			
Kansas	70	T.	2	1						1			1													1								2	T.		
Kentucky	30	T.		1																	2							1	3	2				9	T.		
Louisiana	47	T.	2	2		8	1						1						1														17	T.			
Maine	19	T.								11																									11	T.	
Maryland	26	T.		2		3						1																			1	1		9	T.		
Massachusetts	84	T.																																	1	T.	
Michigan	70	T.		5	1					3		2	1		1								1											11	T.		
Minnesota	67	T.	1			2					1	1								2	1													10	T.		
Mississippi	46	T.	3		1	7	3	1			1	7	1												6									31	T.		
Missouri	97	T.		1		2	2	3			3	1	3	1	1	2																		18	T.		
Montana	7	T.	15	6	2	20	1					7	4								1							5	2					64	T.		
Nebraska	67	T.																																	1	T.	
Nevada	47	T.																																	3	T.	
New Hampshire	31	T.								5																									2	T.	
New Jersey	57	T.		3		1						1																							5	T.	
New Mexico	22	T.																																	7	T.	
New York	77	T.																																	0	T.	
North Carolina	57	T.	3	4	1	7			1	4	3	2	3													4								34	T.		
North Dakota	33	T.																																	21	T.	
Ohio	127	T.		2		4		1	1	5	1	3			5	1																		25	T.		
Oklahoma	14	T.	1																																2	T.	
Oregon	65	T.				1																													0	T.	
Pennsylvania	84	T.																																	4	T.	
Rhode Island	9	T.																																	0	T.	
South Carolina	49	T.			2																														6	T.	
South Dakota	39	T.	1																																1	T.	
Tennessee	48	T.		2																															3	T.	
Texas	77	T.		5	3		3																												11	T.	
Utah	32	T.				2																													3	T.	
Vermont	14	T.																																	3	T.	
Virginia	39	T.	1	3		2	1																												9	T.	
Washington	40	T.																																		8	T.
West Virginia	34	T.		2																															7	T.	
Wisconsin	57	T.																																		13	T.
Wyoming	12	T.	6	16		3	4	2	3	1			8	1																					44	T.	
		T.	1																																15	T.	
Sums	2,418	T.	57	72	13	7	71	30	6	3	24	5	43	14	5	2	1	3	1	9	39	16	6	12	7	25	33	28	22	1	3	1	4	559	T.		
		A.	5	20	1	6	21	8	4	4	17	7	16	5	11	0	4	6	1	0	1	1	1	0	1	4	1	0	1	2	3	1	1	159	A.		

THUNDERSTORMS.

Description of the more severe thunderstorms reported for the month is given under "Local storms."

The dates on which reports of thunderstorms were least numerous over the country, taken as a whole, were: none on the 8th and 15th; 1 on the 16th, 18th, and 31st; 3 on the 17th and 30th.

The dates on which reports were most numerous were: 72 on the 2d, and 71 on the 5th.

The states from which reports were least numerous were: California, North Dakota, Pennsylvania, Utah, and Vermont, 3; Delaware, Indian Territory, Nebraska, Nevada, 2; Connecticut, District of Columbia, Georgia, Massachusetts, South Dakota, 1; Idaho, Montana, New Mexico, Rhode Island, Wyoming, Oklahoma, 0.

The detailed distribution of reports of thunderstorms is shown in the accompanying table for each date and state. The left-hand column of this table shows the number of stations from which meteorological reports have been received from each state, but it is not certain that all these observers have been equally careful to record all the auroras and thunderstorms that have occurred; indeed it is quite probable that many of them pay special attention to these phenomena while others neglect them. It would be improper to make very positive statements as to relative frequency of thunderstorms and auroras for each portion of the United States until there is more uniformity in the degree of attention paid by the observers. Observers will confer a favor on the students of this branch of meteorology if, while making an occasional note of a severe thunderstorm or a bright aurora, they will also state whether they have uniformly looked for these phenomena and whether the absence of a record on any date, or better still the word "none," indicates that no aurora or thunderstorm occurred within their horizon. The editor hopes in an early number of this WEATHER REVIEW to substitute for the total numbers of stations here given, the numbers of those observers who send in complete records of the occurrence of thunderstorms and auroras. When this is done it will be possible to give more accurately the relative frequency of thunderstorms for each state and month. So far as the data in the accompanying table warrants any statement it would seem that the number of thunderstorms per station per month has been as follows: Florida, 0.8; Illinois, 0.7; Iowa, 0.9; Missouri, 0.7; Ohio, 1.0; Wisconsin, 0.8. The relatively high percentage for Ohio may be partly due to the special care of the observers.

AURORAS.

The detailed distribution of auroras, as far as they have been reported, is shown in the accompanying table for each date and state, and the remarks just made with regard to reports of thunderstorms will apply equally to those of auroras. It is considered very desirable that the occurrence of auroras should be watched for by every observer at the ordinary hours of evening observation, and as much more frequently during the night as possible. It is certain that many of the observers whose monthly reports show no auroras have generally omitted to look for them; it will contribute greatly to the accuracy of all studies into the distribution of auroras if those who do not specially look for them, and who, therefore, cannot give positive testimony as to their presence or absence, will use the word "Blank" or a dash (—) to indicate this fact, so that the monthly record from such a station will read about as follows:

"Auroras actually seen on three evenings and one early morning; certainly no auroras on five evenings; six evenings when clouds, haze, moonlight, or city illuminations obscured any aurora that might have been present; seventeen evenings blank, viz., without special observation."

The dates of auroras as given by the observers should uni-

formly refer to the evening of the civil date; auroras observed after midnight should be distinctively marked, *e. g.*, "On the 14th, a. m.;" the simple record "14th" would otherwise be understood to mean the "14th p. m.;" the record should not read "October 15th, aurora observed last night," but rather "October 15th, aurora observed this morning early," or "October 14th, aurora this evening," so that in all cases there may be no doubt as to the civil date of the morning or evening on which the aurora occurred.

So far as can be gathered from the data in the accompanying table the evenings on which fewest auroras were reported were, none on October 19th, 23d, 27th; one on October 3d, 18th, 20th, 21st, 22d, 24th, 26th, 28th. The observation of these isolated or sporadic auroras is very desirable, as the study of such cases seems likely to be especially instructive as to the causes and conditions of the phenomenon.

The moon was full on October 24th and 25th, and faint auroras were therefore difficult to observe from the 20th to the 28th; observers should be especially watchful on moonlight nights, and if they have reason to think that on any special occasion an aurora of ordinary intensity may have been hidden by the moonlight or the bright illumination of the city, they may count these nights in with the hazy and cloudy nights.

Omitting the moonlight evenings, 20–28th, inclusive, the tabulated data show that on the remaining 22 evenings there were 148 reports of observed auroras, or an average of 6.8 per day. The days whose reports are decidedly above this average are 20 on the 2d; 21 on the 5th; 17 on the 9th; 16 on the 11th; and 11 on the 14th. The states from which the reports of auroras were most numerous during the month were: Wisconsin, 15; North Dakota, 25; New York, 34; Minnesota, 18; Michigan, 10; Massachusetts, 11.

The number of evenings on which auroras were reported in the respective states is as follows: on one evening in Connecticut, Illinois, Indiana, Missouri, New Jersey, and Wyoming; on 2 evenings in Iowa, Nebraska, Ohio, South Dakota; on 3 evenings in Montana and Washington; on 5 evenings in New Hampshire; on 6 in Maine, Massachusetts, and Vermont; on 8 in Michigan; on 9 in Wisconsin; 10 in North Dakota; 11 in Minnesota; 14 in New York.

The relative frequency of auroras, or the number per station per month, was about as follows: North Dakota, 0.8; Vermont, 0.7; New York, 0.4; Wisconsin and Minnesota, 0.3; Massachusetts, 0.1.

The relation of the auroras to thunderstorms continues as stated by the editor in connection with the aurora of February, 1872, and in the MONTHLY WEATHER REVIEW for 1874, and in his report on the aurora of April 7th of that year, viz., that the aurora is most frequent in the northern part of the country when thunderstorms are more frequent to the southward; an apparent exception to this rule would seem to have occurred on the 1st of October when the auroras were too few, and on the 14th when they were too numerous, as compared with the number of thunderstorms; such exceptions may show the necessity of modifying the rule when the reports of thunderstorms and auroras have been more thoroughly systematized. As stated at that time, the aurora is an electrical discharge between masses of air rather than between the air and the ground, although sometimes the latter may also occur in high northern latitudes; it is usually confined to a widespread horizontal area at a very moderate height above the earth as compared with the great heights that have been usually attributed to it; the layer in which it occurs apparently represents the boundary region between a lower layer of cold, dry air, and an upper layer of moister air that is overflowing; these conditions are such as prevail in the northern quadrant of an area of low pressure or the southern edge of a high area, at least in latitudes 40° to

60° and east of the Rocky Mountains. The lightning discharge between clouds at low altitudes or between them and the earth requiring, as it does, higher temperatures, more aqueous vapor, and more rapidly ascending currents, is characteristic of the areas of low pressure, and especially of the quadrant of southerly winds, as was then pointed out; while auroras, requiring lower temperature, less vapor, and probably spiculæ of ice such as attend the formation of snow, are characteristic of the upper layers over the region intermediate between the areas of lowest and highest pressures, and where the ascending air of the low pressures is spreading horizontally above while the descending air of the areas of high pressure is spreading horizontally below.

The meteorological conditions necessary to the production of the auroral light may be either widespread or local. The principal condition seems to be the presence of a layer of air in which moisture is condensing into minute spiculæ of ice; this condition prevails over the broad zones around the earth within 30° of the north and south poles throughout the greater portion of the year, and it may possibly prevail in the upper atmosphere throughout the year much nearer the equator; this condition also prevails especially on the northern side of the areas of low pressure, or storm centers, and therefore on the easterly quadrant of the areas of high pressure. But notwithstanding this favorable meteorological condition, there can be no aurora without a special discharge of electricity.

The ultimate origin of electrical disturbance may be either cosmical or terrestrial. If the former, then auroras are subject to periods of 1, 11, or 55 years; but if the latter, and especially in so far as this disturbance is piezo-electrical, there will be lunar and solar tidal periods, and there may also be localities of special frequency, such as the auroral zone in northern latitude 55° to 70°. It is thus plain that the aurora depends on the one hand on the condition of the atmosphere and on the other hand on the condition of the interior of the earth and the sun. When an electrical disturbance from the sun, or from the interior of the earth, reaches the earth's atmosphere it will produce an auroral light in those portions of the atmosphere whose conditions are favorable thereto, but not otherwise. The two conditions must combine in order to produce the auroral effect.

EARTH CURRENTS AND MAGNETIC STORMS.

The electrical disturbances known as "earth currents" in telegraphy and "magnetic storms" in terrestrial magnetism, are a part of the same system of atmospheric phenomena. Reports of earth currents and magnetic storms have not been received during October, but will be included in future numbers of this REVIEW if any observers report upon these subjects to the Weather Bureau, as it is desirable that the REVIEW should deal comprehensively with all matters bearing on the weather of the month.

STATE WEATHER SERVICES.

[*Temperature in degrees Fahrenheit; precipitation, including melted snow, in inches and hundredths.*]

The following extracts and summaries are republished from reports for October, 1893, of the directors of the various state weather services:

ALABAMA.

Temperature.—The mean was 1.5 below the normal; maximum, 95, at Eufaula, 8th; minimum, 22, at Decatur, 31st; greatest monthly range, 64, at Newburg; least monthly range, 36, at Birmingham.

Precipitation.—The average was 0.18 below the normal; greatest monthly, 8.56, at Mobile; least monthly, 0.10, at Clanton.

Wind.—Prevailing direction, north.—*W. M. Dudley, Observer, Weather Bureau, Montgomery, director.*

ARIZONA.

Temperature.—Maximum, 101, at Fort Mohave, 14th; minimum, 23, at Flagstaff, 2d; greatest monthly range, 63, at San Carlos; least monthly range, 39, at Lochiel.

Precipitation.—Greatest monthly, 0.40, at Buckeye and Payson; least monthly, 0.00, at several stations.

Wind.—Prevailing direction, southwest.—*W. Burrows, Observer, Weather Bureau, Tucson, director.*

ARKANSAS.

Temperature.—The mean was 0.8 above the normal; maximum, 99, at Rison, 1st; minimum, 23, at Keesees Ferry, 29th; greatest monthly range, 69, at Rison; least monthly range, 40, at Mount Nebo.

Precipitation.—The average was 0.92 below the normal; greatest monthly, 3.43, at Corning; least monthly, 0.25, at Arkansas City and Prescott.

Wind.—Prevailing direction, south.—*F. H. Clarke, Local Forecast Official, Weather Bureau, Little Rock, director.*

CALIFORNIA.

Temperature.—The mean was 1.0 below the normal; maximum, 102, at Salton, Indio, and Volcano Springs, 8th; minimum, 20, at Boca and Cisco, 16th; greatest monthly range, 68, at Tulare; least monthly range, 25, at Point Lobos.

Precipitation.—The average was 0.80 below the normal; greatest monthly, 6.22, at Crescent City; least monthly, 0.00, at a number of stations.

Wind.—Prevailing direction, west.—*J. A. Barwick, Observer, Weather Bureau, Sacramento, director.*

COLORADO.

Temperature.—The mean was 1.0 below the normal; maximum, 90, at Lamar, 9th, and Minneapolis, 7th; minimum, —2, at Pikes Peak, 26th.

Precipitation.—The average was 0.20 below the normal; greatest monthly, 4.10, at Pikes Peak; least monthly, 0.00, at several stations.

Wind.—Prevailing direction, west.—*J. J. Gilligan, Observer, Weather Bureau, Denver, director.*

FLORIDA.

Temperature.—Maximum, 95, at Plant City, 2d; minimum, 41, at Moseley

Hall, 31st; greatest monthly range, 48, at Archer; least monthly range, 20, at Key West.

Precipitation.—Greatest monthly, 11.72, at Jupiter; least monthly, 0.94, at Brookville.

Wind.—Prevailing direction, northeast.—*E. R. Demain, Observer, Weather Bureau, Jacksonville, director.*

GEORGIA.

Temperature.—Maximum, 95, at Darien, 3d; minimum, 24, at Clayton and Lafayette, 31st; greatest monthly range, 61, at Ramsey; least monthly range, 36, at Dublin.

Precipitation.—Greatest monthly, 6.91, at Savannah; least monthly, 0.30, at Piscola.

Wind.—Prevailing direction, northwest.—*Park Morrill, Local Forecast Official, Weather Bureau, Atlanta, director.*

IDAHO.

Temperature.—Maximum, 80, at Oakley, 8th; minimum, 3, at Martin, 30th; greatest monthly range, 62, at Bonanza City and Martin; least monthly range, 37, at Fort Sherman.

Precipitation.—Greatest monthly, 5.52, at Grangeville; least monthly, 0.02, at Martin.

Wind.—Prevailing direction, southwest.—*J. H. Smith, Observer, Weather Bureau, Idaho Falls, director.*

ILLINOIS.

Temperature.—The mean was 1.0 above the normal; maximum, 92, at Greenville, 9th; minimum, 15, at Dixon and Philo, 30th, and at Aurora, 31st.

Precipitation.—The average was 1.54 below the normal; greatest monthly, 6.55, at Jordans Grove; least monthly, trace, at Bushnell.

Wind.—Prevailing direction, south.—*John Craig, Observer, Weather Bureau, Springfield, director.*

INDIANA.

Temperature.—The mean was 1.2 above the normal; maximum, 86, at Bedford, 13th, at Union City, 10th, and at Vevay, 11th; minimum, 17, at Lafayette, 30th; greatest monthly range, 68, at Lafayette; least monthly range, 52, at New Albany and Columbia City.

Precipitation.—The average was 0.79 above the normal; greatest monthly, 6.18, at Bedford; least monthly, 1.57, at Lafayette.

Wind.—Prevailing direction, southeast.—*Prof. H. A. Huston, Lafayette, director; C. F. E. Wappenhans, Local Forecast Official, Weather Bureau, assistant.*

IOWA WEATHER AND CROP SERVICE.

Temperature.—Maximum, 94, at Glenwood, 10th; minimum, 10, at Emmetsburg, 29th; greatest monthly range, 75, at Emmetsburg; least monthly range, 50, at Hopkinton.